

**Remarks**

Applicants respectfully request reconsideration of the rejection of the claims in view of the above amendments and the remarks set forth below. Claims 1-20 remain in the application. Claims 21 and 22 are added. Claims 1-20 remain unchanged and claims 21 and 22 are new.

**35 U.S.C. §112, Paragraph 2**

Claims 3 and 15 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite since the specification (at page 7, lines 4-8):

1. Appeared to indicate that taps are initialized simultaneously and not following adaptation of a 1<sup>st</sup> tap; and
2. Did not appear to differentiate between individual tap settings.

Applicants respectfully direct the Examiner's attention to the specification from page 12, line 20 to page 13, line 14. Applicants respectfully propose that this portion of the specification supports the subject matter recited in claims 3 and 15. Applicants request reconsideration of the rejection of claims 3 and 15 under 35 U.S.C. 112, second paragraph, in view of the above remarks.

**Claim Objections**

Applicants respectfully note that claims 6 and 18 were deemed to be allowable if they were rewritten in independent form including all the limitations of the base claim and any intervening claims. Newly added claim 21 includes the limitations of claim 6, base claim 1, and intervening claims 2-5. Newly added claim 22 includes the limitations of claim 18, base claim 13, and intervening claims 14-17.

**35 U.S.C. §103**

Claims 1-5 and 13-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Rademacher (U.S. Patent No. 6,570,918).

Under U.S.C. § 103, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references

themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. (MPEP § 706.02(j)).

Claim 1 recites, inter alia, a "method for initializing an equalizer in an Orthogonal Frequency Division Multiplexing ("OFDM") receiver, the method comprising the step of...inhibiting, based at least in part on...*a time between a first OFDM signal and a second OFDM signal being less than a second limit*, an initialization of the first tap." Inhibiting the initialization of an equalizer tap based upon the time between a first OFDM signal and a second OFDM signal is an important aspect of Applicants' claimed invention. As discussed in the specification on page 10, lines 3-19:

At step 270, tap initialization controller 108 determines whether the TIMER that measures the time between reception of the latest two transmissions exceeds a predetermined limit. If so, then it is presumed that the channel has probably changed enough to require re-initialization of all of the equalizer taps. Accordingly, if the TIMER exceeds the limit then initialization controller 108 proceeds to step 310, step 320, and step 350, where tap initialization controller 108 resets or clears the TIMER, re-initializes all of the equalizer taps, and exits method 200, respectively. On the other hand, if the TIMER does not exceed the limit then tap initialization controller 108 proceeds to step 280.

At step 280, tap initialization controller 108 resets the TIMER. Here, it should be appreciated that since the tap initialization controller 108 has determined that a new transmission has been received (see step 220, above) within the predetermined time limit (see step 270, above), tap initialization controller 108 resets the TIMER so that a new time interval can be measured between the present transmission and the next transmission. From step 280, tap initialization controller 108 proceeds to step 290.

Furthermore, the "inhibiting, based at least in part on...*a time between a first OFDM signal and a second OFDM signal being less than a second limit*, an initialization of the first tap" recitation of claim 1 solves a problem found in conventional OFDM receivers. As discussed on page 3 of the specification:

Historically, initialization of the equalizer taps has been a noisy process. Conventional OFDM receivers typically initialize the equalizer taps with (X/Y), which represents a division of a predetermined, stored frequency-domain representation of an expected OFDM signal (i.e., a "training symbol" or "X") by the frequency-domain representation of the corresponding actual received signal ("Y"). The taps are typically initialized based on just one or maybe an average of

two training symbols, and they are re-initialized upon receipt of each new packet of data. Such initialization schemes are based on a simplified frequency-domain model for a relatively noise free channel that assumes orthogonality among the subcarriers, in which  $Y=C*X$ , where a received signal (Y) is merely a transmitted signal (X) times the channel response (C). In such a case,  $C=Y/X$  and thus, to compensate for the channel response, the equalizer is initialized with  $1/C$ , or  $X/Y$ . However, in actuality,  $Y=C*X + N$ , where N is the channel noise. The small number of symbols used for the conventional initialization schemes does not average out the effects of this channel noise. It is typically not until well after an initialization (when the taps have been adapted using several data symbols from the same packet) before a tap update algorithm has smoothed out the effects of the noise. The conventional practice of re-initializing the taps upon receipt of each new data packet undesirably repeatedly re-introduces the effects of the channel noise. The present invention is directed to the correction of this problem.

Rademacher appears to be directed towards a receiver and method for recovering data from spread spectrum radio signals. (Col. 1, lines 8-11). In the Office Action, column 12, lines 10-32 of Rademacher were cited as teaching the “inhibiting, based at least in part on...*a time between a first OFDM signal and a second OFDM signal being less than a second limit*, an initialization of the first tap” recitation of claim 1. Applicants respectfully disagree. Nowhere in the cited section does “*a time between a first OFDM signal and a second OFDM signal being less than a second limit*” appear to be discussed, let alone inhibiting the initialization of an equalizer tap based upon “*a time between a first OFDM signal and a second OFDM signal being less than a second limit*.”

As a result, it is respectfully submitted that Rademacher does not teach or suggest the “inhibiting, based at least in part on...*a time between a first OFDM signal and a second OFDM signal being less than a second limit*, an initialization of the first tap” recitation of claim 1. Therefore it is respectfully proposed that the rejection of claim 1 under 35 U.S.C. § 103(a) is overcome in accordance with the above remarks and notice to that effect is earnestly solicited.

Dependent claims 2-5, being dependent on and further limiting independent claim 1, should be allowable for that reason, as well as for the additional recitations that they contain. Therefore, it is respectfully proposed that the rejection of claims 2-5 under 35 U.S.C. § 103(a) is overcome in accordance with the above remarks and notice to that effect is earnestly solicited.

Independent claim 13 includes a “*time between a first OFDM signal and a second OFDM signal being less than a second limit*” recitation similar to the recitation of claim 1.

Thus, independent claim 13 is patentably distinguishable from Rademacher for the reason given above with respect to independent claim 1 and notice to that effect is earnestly solicited.

Dependent claims 14-17, being dependent on and further limiting independent claim 13, should be allowable for that reason, as well as for the additional recitations that they contain. Therefore, it is respectfully proposed that the rejection of claims 14-17 under 35 U.S.C. § 103(a) is overcome in accordance with the above remarks and notice to that effect is earnestly solicited.

Claims 9-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pollmann et al. (U.S. Patent No. 6,597,733).

Claim 9 recites, inter alia, a “method for initializing an equalizer in an Orthogonal Frequency Division Multiplexing (“OFDM”) receiver, the method comprising the steps of...re-initializing the plurality of taps *upon a passage of a predetermined time between an OFDM signal and a subsequent OFDM signal.*” As discussed above, tracking the “*passage of a predetermined time between an OFDM signal and a subsequent OFDM signal*” is an important aspect of applicants claimed invention.

Pollmann appears to be directed towards equalizer performance enhancements for broadband wireless applications. (Col. 1, lines 1-3). In the Office Action, column 7, lines 17-21 of Pollmann were cited as teaching the “re-initializing the plurality of taps *upon a passage of a predetermined time between an OFDM signal and a subsequent OFDM signal.*” Applicants respectfully disagree. Nowhere in the cited section does “*a passage of a predetermined time between an OFDM signal and a subsequent OFDM signal*” appear to be discussed, let alone re-initializing the plurality of taps upon “*a passage of a predetermined time between an OFDM signal and a subsequent OFDM signal.*” Moreover, the cited paragraph in Pollmann goes on to describe an equalizer tap initialization process that initializes the equalizer taps upon the reception each new signal burst. (Col. 7, lines 21-31). As a result, Pollmann appears to teach away from “re-initializing the plurality of taps *upon a passage of a predetermined time between an OFDM signal and a subsequent OFDM signal*” since Pollmann appears to teach the initialization of taps upon each reception of a signal burst. Indeed, the

Pollmann initialization process appears to a very similar to the initialization processes of conventional OFDM receivers discussed in Applicants' specification (page 3, lines 18-21):

The conventional practice of re-initializing the taps upon receipt of each new data packet undesirably repeatedly re-introduces the effects of the channel noise. The present invention is directed to the correction of this problem.

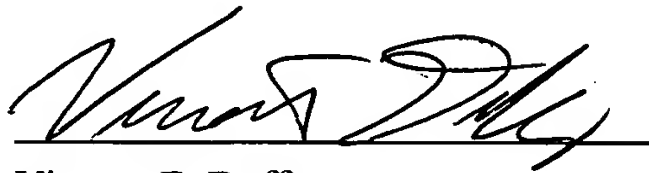
As a result, it is respectfully submitted that Pollman does not teach or suggest the "re-initializing the plurality of taps *upon a passage of a predetermined time between an OFDM signal and a subsequent OFDM signal*" recitation of claim 9. Therefore it is respectfully proposed that the rejection of claim 9 under 35 U.S.C. § 103(a) is overcome in accordance with the above remarks and notice to that effect is earnestly solicited.

Dependent claims 10-12, being dependent on and further limiting independent claim 9, should be allowable for that reason, as well as for the additional recitations that they contain. Therefore, it is respectfully proposed that the rejection of claims 10-12 under 35 U.S.C. § 103(a) is overcome in accordance with the above remarks and notice to that effect is earnestly solicited.

Having fully addressed the Examiner's rejections it is believed that, in view of the preceding remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicants' attorney at (317) 587-4019, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No fees, other than the fees for a two-month extension of time and the addition of two new independent claims, are believed due. However, if additional fees are due, please charge the additional fee to Deposit Account 07-0832.

Respectfully submitted,



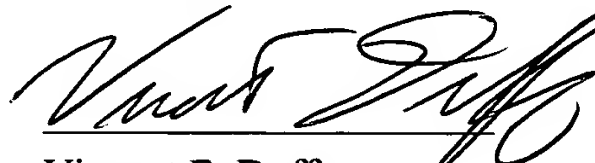
By: Vincent E. Duffy  
Reg. No. 39,964  
Phone (317) 587-4019

Patent Operations  
THOMSON multimedia Licensing, Inc.  
P.O. Box 5312  
Princeton, New Jersey 08543-5312  
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I hereby certify that this amendment is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on:

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Vincent E. Duffy